

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 1 of 13

Complete if Known

|                        |                    |
|------------------------|--------------------|
| Application Number     |                    |
| Filing Date            | September 30, 2003 |
| First Named Inventor   | Lester F. Ludwig   |
| Group Art Unit         |                    |
| Examiner Name          |                    |
| Attorney Docket Number | 2738-21            |

### U.S. PATENT DOCUMENTS

| Examiner<br>Initials * | Cite<br>No. <sup>1</sup> | Document Number                            | Publication Date<br>MM-DD-YYYY | Name of Patentee or Applicant of<br>Cited Document | Pages, Columns, Lines, Where Relevant<br>Passages or Relevant<br>Figures Appear |
|------------------------|--------------------------|--|--------------------------------|--|---|
|                        |                          | Number - Kind Code <sup>2</sup> (if known) |                                |  |   |
| [Signature]            | A1                       | US-1,947,020                               | 02-13-1934                     | Ranger   |   |
|                        | A2                       | US-3,493,669                               | 02-03-1970                     | Elbrecht et al.                                    |   |
|                        | A3                       | US-3,591,699                               | 07-06-1971                     | Cutler   |   |
|                        | A4                       | US-3,612,741                               | 10-12-1971                     | Marshall   |   |
|                        | A5                       | US-3,651,242                               | 03-21-1972                     | Evans  |   |
|                        | A6                       | US-3,730,046                               | 05-01-1973                     | Spence   |   |
|                        | A7                       | US-3,742,133                               | 06-26-1973                     | Cohen  |   |
|                        | A8                       | US-3,805,091                               | 04-16-1974                     | Colin  |   |
|                        | A9                       | US-3,813,473                               | 05-28-1974                     | Terymenko  |   |
|                        | A10                      | US-3,878,748                               | 04-22-1975                     | Spence   |   |
|                        | A11                      | US-3,956,959                               | 05-18-1976                     | Ebihara et al.                                     |   |
|                        | A12                      | US-3,962,945                               | 06-15-1976                     | Creager et al.                                     |   |
|                        | A13                      | US-4,075,921                               | 02-28-1978                     | Heet   |   |
|                        | A14                      | US-4,080,867                               | 03-28-1978                     | Ratanangsu   |   |
|                        | A15                      | US-4,117,413                               | 09-26-1978                     | Moog   |   |
|                        | A16                      | US-4,122,742                               | 10/31/1978                     | Deutsch  |   |
|                        | A17                      | US-4,151,368                               | 04-24-1979                     | Fricke et al.                                      |   |
|                        | A18                      | US-4,182,213                               | 01-08-1980                     | Iodice   |   |
|                        | A19                      | US-4,274,321                               | 06-23-1981                     | Swartz   |   |
|                        | A20                      | US-4,318,327                               | 03-09-1982                     | Toups  |   |

### FOREIGN PATENT DOCUMENTS

| Examiner<br>Initials * | Cite<br>No. <sup>1</sup> | Foreign Patent Document  | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited<br>Document | Pages, Columns, Lines,<br>Where Relevant<br>Passages or Relevant<br>Figures Appear | T <sup>6</sup> |
|------------------------|--------------------------|--|--------------------------------|---|--|----------------|
|                        |                          | Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if<br>known) |                                |   |  |                |
| [Signature]            | B1                       | EP-0 574 213-A1  | 12-15-1993                     | Synaptics, Inc.                                       |  |                |
|                        |                          |  |                                |   |  |                |
|                        |                          |  |                                |   |  |                |
|                        |                          |  |                                |   |  |                |
|                        |                          |  |                                |   |  |                |
|                        |                          |  |                                |   |  |                |
|                        |                          |  |                                |   |  |                |

Examiner  
Signature

Date  
Considered

10/27/04

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 801.04.

<sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

|   |   |    |    |                        |                    |
|---|---|----|----|------------------------|--------------------|
| Substitute for form 1448A/PTO   |   |    |    | Complete If Known      |                    |
|   |   |    |    | Application Number     |                    |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(use as many sheets as necessary) |   |    |    | Filing Date            | September 30, 2003 |
|   |   |    |    | First Named Inventor   | Lester F. Ludwig   |
|   |   |    |    | Group Art Unit         |                    |
|   |   |    |    | Examiner Name          |                    |
|   |   |    |    | Attorney Docket Number | 2738-21            |
| Sheet   | 2 | of | 13 |                        |                    |

| U.S. PATENT DOCUMENTS   |                          |  |  |                                |  |   |
|---|--------------------------|--|--|--------------------------------|--|---|
| Examiner<br>Initials *  | Cite<br>No. <sup>1</sup> | Document Number                            |  | Publication Date<br>MM-DD-YYYY | Name of Patentee or Applicant of<br>Cited Document | Pages, Columns, Lines, Where Relevant<br>Passages or Relevant<br>Figures Appear |
|   |                          | Number - Kind Code <sup>2</sup> (if known) |  |                                |  |   |
| UP<br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br>< |                          |  |  |                                |  |   |

| FOREIGN PATENT DOCUMENTS |                          |  |                                |   |  |                |
|--------------------------|--------------------------|--|--------------------------------|---|--|----------------|
| Examiner<br>Initials*    | Cite<br>No. <sup>1</sup> | Foreign Patent Document  | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited<br>Document | Pages, Columns, Lines,<br>Where Relevant<br>Passages or Relevant<br>Figures Appear | T <sup>o</sup> |
|                          |                          | Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if<br>known) |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |
|                          |                          |  |                                |   |  |                |

|                       |   |                    |          |
|-----------------------|---|--------------------|----------|
| Examiner<br>Signature |  | Date<br>Considered | 10/27/04 |
|-----------------------|---|--------------------|----------|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 601.04.  
<sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

|   |   |    |    |                        |                    |
|---|---|----|----|------------------------|--------------------|
| Substitute for form 1448A/PTO   |   |    |    | Complete If Known      |                    |
|   |   |    |    | Application Number     |                    |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(use as many sheets as necessary) |   |    |    | Filing Date            | September 30, 2003 |
|   |   |    |    | First Named Inventor   | Lester F. Ludwig   |
|   |   |    |    | Group Art Unit         |                    |
|   |   |    |    | Examiner Name          |                    |
|   |   |    |    | Attorney Docket Number | 2738-21            |
| Sheet   | 3 | of | 13 |                        |                    |

| U.S. PATENT DOCUMENTS |                       |  |                                |  |   |
|-----------------------|-----------------------|--|--------------------------------|--|---|
| Examiner Initials*    | Cite No. <sup>1</sup> | Document Number                            | Publication Date<br>MM-DD-YYYY | Name of Patentee or Applicant of<br>Cited Document | Pages, Columns, Lines, Where Relevant<br>Passages or Relevant<br>Figures Appear |
|                       |                       | Number - Kind Code <sup>2</sup> (if known) |                                |  |   |
| [Signature]           | A41                   | US-5,459,282                               | 10-17-1995                     | Willis   |   |
|                       | A42                   | US-5,471,008                               | 11-28-1995                     | Fujita et al.                                      |   |
|                       | A43                   | US-5,475,214                               | 12-12-1995                     | DeFranco et al.                                    |   |
|                       | A44                   | US-5,565,641                               | 10-15-1996                     | Gruenbaum  |   |
|                       | A45                   | US-5,585,588                               | 12-17-1996                     | Tamura   |   |
|                       | A46                   | US-5,659,145                               | 08-19-1997                     | Weil   |   |
|                       | A47                   | US-5,659,466                               | 08-19-1997                     | Norris et al.                                      |   |
|                       | A48                   | US-5,665,927                               | 09-09-1997                     | Taki et al.  |   |
|                       | A49                   | US-5,668,338                               | 09-16-1997                     | Hewitt et al.                                      |   |
|                       | A50                   | US-5,875,100                               | 10-07-1997                     | Hewlett  |   |
| [Signature]           | A51                   | US-5,741,993                               | 04-21-1998                     | Kushimiya  |   |
|                       | A52                   | US-5,763,806                               | 06-09-1998                     | Willis   |   |
|                       | A53                   | US-5,786,540                               | 06-28-1998                     | Westlund   |   |
|                       | A54                   | US-5,827,989                               | 10-27-1998                     | Fay et al.   |   |
|                       | A55                   | US-5,850,051                               | 12-15-1998                     | Machover et al.                                    |   |
|                       | A56                   | US-5,852,251                               | 12-22-1998                     | Su et al.  |   |
|                       | A57                   | US-5,932,827                               | 08-03-1999                     | Osborne et al.                                     |   |
|                       | A58                   | US-5,969,283                               | 10-19-1999                     | Looney et al.                                      |   |
|                       | A59                   | US-6,047,073                               | 04-04-2000                     | Norris et al.                                      |   |
|                       | A60                   | US-6,051,769                               | 04-18-2000                     | Brown, Jr.   |   |

| FOREIGN PATENT DOCUMENTS |                       |   |                                |   |  |                |
|--------------------------|-----------------------|---|--------------------------------|---|--|----------------|
| Examiner Initials*       | Cite No. <sup>1</sup> | Foreign Patent Document   | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited<br>Document | Pages, Columns, Lines,<br>Where Relevant<br>Passages or Relevant<br>Figures Appear | T <sup>6</sup> |
|                          |                       | Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if known) |                                |   |  |                |
|                          |                       |   |                                |   |  |                |
|                          |                       |   |                                |   |  |                |
|                          |                       |   |                                |   |  |                |
|                          |                       |   |                                |   |  |                |
|                          |                       |   |                                |   |  |                |
|                          |                       |   |                                |   |  |                |
|                          |                       |   |                                |   |  |                |
|                          |                       |   |                                |   |  |                |

|                    |             |                 |          |
|--------------------|-------------|-----------------|----------|
| Examiner Signature | [Signature] | Date Considered | 10/27/04 |
|--------------------|-------------|-----------------|----------|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04.  
<sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Substitute for form 1449A/PTO

**(use as many sheets as necessary)**

|       |   |    |    |
|-------|---|----|----|
| Sheet | 4 | of | 13 |
|-------|---|----|----|

**Complete if Known**

|                        |                    |
|------------------------|--------------------|
| Application Number     |                    |
| Filing Date            | September 30, 2003 |
| First Named Inventor   | Lester F. Ludwig   |
| Group Art Unit         |                    |
| Examiner Name          |                    |
| Attorney Docket Number | 2738-21            |

[illegible][illegible]

**Examiner  
Signature**

Date Considered

**EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04.

<sup>2</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language Translation is attached.

**Burden Hour Statement:** This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:** Assistant Commissioner for Patents, Washington, DC 20231.

|   |   |    |    |                          |                    |
|---|---|----|----|--------------------------|--------------------|
| Substitute for form 1448A/PTO   |   |    |    | <b>Complete if Known</b> |                    |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(use as many sheets as necessary) |   |    |    | Application Number       |                    |
|   |   |    |    | Filing Date              | September 30, 2003 |
|   |   |    |    | First Named Inventor     | Lester F. Ludwig   |
|   |   |    |    | Group Art Unit           |                    |
|   |   |    |    | Examiner Name            |                    |
| Sheet   | 5 | of | 13 | Attorney Docket Number   | 2738-21            |

| OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS |                       |   |                |
|---|-----------------------|---|----------------|
| Examiner Initials *                               | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
|   | C1                    | "Biax True Stereo Pickups," product description, Musician's Friend catalog.   |                |
|   | C2                    | "Korg's New Z-1 Helps Fiddler Keep His Funk", Music and Sound Retailer, Mar. 1998.  |                |
|   | C3                    | "Synaptics Targets Vision, Sound processing."   |                |
|   | C4                    | "Yamaha VL1", advertisement, Electronic Musician, Apr. 1994.  |                |
|   | C5                    | APPELMAN, D. RALPH, The Science of Vocal Pedagogy, Theory and Applications, 1967, Indiana University Press, Bloomington, Indiana, USA.  |                |
|   | C6                    | Biaxe Ragamaster, Box 15426, Stamford, CT, 06901-0426, USA.   |                |
|   | C7                    | BICANIC, DANE, ed. Photoacoustic and Photothermal Phenomena III. 1992, vol. 69, Springer-Verlag, Berlin Heidelberg, Germany.  |                |
|   | C8                    | BORMANS, JAN "MPEG-4 systems need specialized CPUs", Electronic Engineering Times, Jan. 25, 1999.   |                |
|   | C9                    | Boss DF-2, Roland Corporation, 7200 Dominion Circle, Los Angeles, CA 90040-3696, USA.   |                |
|   | C10                   | Boss OC-2 Service Manual, Roland Corporation, 7200 Dominion Circle, Los Angeles 90040-3696, CA, USA.  |                |
|   | C11                   | Boss SE-70 Super Effects Processor Algorithm Guide, Roland Corporation, 7200 Dominion Circle, Los Angeles, CA 90040-3696, USA.  |                |

|                    |  |                 |          |
|--------------------|--|-----------------|----------|
| Examiner Signature |  | Date Considered | 10/24/04 |
|--------------------|--|-----------------|----------|

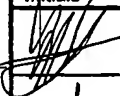

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

|   |   |                          |                    |                        |         |
|---|---|--------------------------|--------------------|------------------------|---------|
| <b>Substitute for form 1449A/PTO</b><br><br><b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(use as many sheets as necessary) |   | <b>Complete if Known</b> |                    |                        |         |
|   |   | Application Number       |                    |                        |         |
|   |   | Filing Date              | September 30, 2003 |                        |         |
|   |   | First Named Inventor     | Lester F. Ludwig   |                        |         |
|   |   | Group Art Unit           |                    |                        |         |
|   |   | Examiner Name            |                    |                        |         |
| Sheet   | 6 | of                       | 13                 | Attorney Docket Number | 2738-21 |

| OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS                                 |   |   |  |
|---|---|---|--|
| Examiner Initials   | Cite No. <sup>1</sup>   | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup>   |
|  | C12   | Boss SE-70 Super Effects Processor Owners Manual, Roland Corporation, 7200 Dominion Circle, Los Angeles, CA 90040-3696, USA.  |  |
|   | C13   | CP-40 Pitch to Midi Converter, Roland, 7200 Dominion Circle, Los Angeles, CA 90040-3696, USA.   |  |
|   | C14   | DMP9-16 Digital Mixing Processor, Yamaha Corporation, PO Box 1, Hamatsu, Japan.   |  |
|   | C15   | DP/4, Ensoniq, 155 Great Valley Parkway, Malvern, PA 19355, USA.  |  |
|   | C16   | E-Bow, Heet Sound Products. PO Box 3312, 611 Ducommun St., Los Angeles, CA 90051, USA.  |  |
|   | C17   | EPSTEIN, "The Search for New Chemical Oscillators," in Chemical Instabilities, Nicolis and Baras (eds.), 1984, D.Reidel Publishing, Dordrecht/Boston/Lancaster.   |  |
|   | C18   | EPSTEIN, IRVING R. "New Chemical Oscillators", Non-Equilibrium in Chemical Systems, 1984, Springer-Verlag, Berlin/Heidelberg, Germany.  |  |
|   | C19   | Ernie Ball, Volume Pedal, Musician's Friend Catalog.  |  |
|   | C20   | Etc., PETER, Letter to Editor, Experimental Musical Instruments, Jun., 1996.  |  |
|   | C21   | EWI3020, AKAI Corporation, Box 2344 Fort Worth, TX 76113, USA.  |  |
|   |  | C22   | FIELD, RICHARD J., and NOYES, RICHARD M. "Oscillations in Chemical Systems IV Limit Cycle Behavior in a Model of a Real Chemical Reaction," J. Chem. Physics, Vol. 60, No. 5, Mar. 1974. |

|                    |   |                 |          |
|--------------------|---|-----------------|----------|
| Examiner Signature |  | Date Considered | 10/27/04 |
|--------------------|---|-----------------|----------|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

|   |                        |                          |                    |
|---|------------------------|--------------------------|--------------------|
| Substitute for form 1449A/PTO   |                        | <b>Complete if Known</b> |                    |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(use as many sheets as necessary) |                        | Application Number       |                    |
|   |                        | Filing Date              | September 30, 2003 |
|   |                        | First Named Inventor     | Lester F. Ludwig   |
|   |                        | Group Art Unit           |                    |
|   |                        | Examiner Name            |                    |
| Sheet 7 of 13   | Attorney Docket Number | 2738-21                  |                    |

| OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS |                       |   |                |
|--|-----------------------|---|----------------|
| Examiner Initials *                                | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
|  | C23                   | GI-10 Guitar-Midi Interface, Roland Corporation, 7200 Dominion Circle, Los Angeles, CA 90040-3696, USA.   |                |
|  | C24                   | GRAY, PETER, and SCOTT, STEPHEN K, "Chemical Oscillations and Instabilities," 1990, Clarendon Press, Oxford, Great Britain.   |                |
|  | C25                   | GSP 21 LEGEND, Digitech, 8760 South Sandy Parkway, Sandy, UT 84070, USA.  |                |
|  | C26                   | GZOWSKI, JOHN "Sirens and Sympathetics", Experimental Musical Instruments, Jun. 1997, vol. 12, No. 4.   |                |
|  | C27                   | HARA, YOSHIKO "Matsushita demos multilayer MPEG-4 compression", Electronic Engineering Times, Apr. 19, 1999.  |                |
|  | C28                   | JOHNSON, COLIN "Computer program recognizes facial expressions", Electronic Engineering Times, Apr. 12, 1999.   |                |
|  | C29                   | JOHNSON, COLIN "Image sensor tracks moving objects in hardware", Electronic Engineering Times, Apr. 5, 1999.  |                |
|  | C30                   | Kaoss pad dynamic effect/controller, Korg Proview Users' magazine, Summer 1999.   |                |
|  | C31                   | KING and WHITE, "Tactile Sensing Array Based on Forming and Detecting an Optical Image," UC Berkeley Preprint.  |                |
|  | C32                   | KURAMOTO, YOSHIKI, "Rhythms and Turbulence in Populations of Chemical Oscillators", Physica 106A (1981), pp. 128-143, North-Holland.  |                |
|  | C33                   | LEIBERMAN, DAVID "Software goes on a search-and-locate mission", Electronic Engineering Times, Jan. 25, 1999, pp. 44.   |                |

|                    |  |                 |          |
|--------------------|--|-----------------|----------|
| Examiner Signature |  | Date Considered | 10/29/04 |
|--------------------|--|-----------------|----------|

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

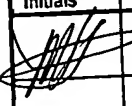

Sheet 8

of 13

**Complete if Known**

|                        |                    |
|------------------------|--------------------|
| Application Number     |                    |
| Filing Date            | September 30, 2003 |
| First Named Inventor   | Lester F. Ludwig   |
| Group Art Unit         |                    |
| Examiner Name          |                    |
| Attorney Docket Number | 2738-21            |

**OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

| Examiner Initials *   | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
|---|-----------------------|---|----------------|
|    | C34                   | LEIBERMAN, DAVID "Touch screens extend grasp into consumer realm" Electronic Engineering Times, Feb. 8, 1999.   |                |
|   | C35                   | Light Wave Pickups, Audio Optics, Santa Barbara, CA., USA.  |                |
|   | C36                   | LIM, AGRAWAL, and NEKLUDOVA "A Fast Algorithm for Labeling Connected Components in Image Arrays", Technical Report Series, No. NA86-2, Thinking Machines Corp., 1986 (rev. 1987), Cambridge, Mass., USA.  |                |
|   | C37                   | Lord LTS-300T Tactile Array Sensor, Lord Corp., Ind. Aut. Div., 407 Gregson Dr., PO Box 8200, Cary, NC, 27511-8200, USA.  |                |
|   | C38                   | LUDWIG, L., "A Generalized Linear Amplitude Processor," Electronotes, Dec. 1979, vol. 11, No. 108.  |                |
|   | C39                   | LUDWIG, L., "A Square-Wave Frequency-Division Sub-Octave Cross-Product Module," Electronotes, Feb. 1979, Vol. 11, No. 98.   |                |
|   | C40                   | LUDWIG, L., "GLAP Revisited," Electronotes, Jul. 1981, vol. 13, No. 127.  |                |
|   | C41                   | LUSHER, E. (unk) "Photoacoustic effect: principles and applications: proceedings of the First International Conference on the Photoacoustics," 1984, Vieweg.  |                |
|   | C42                   | MIDI Player MP-88, Miditemp, Max-Halbe-Strasse 1 85716 Unterschleissheim, Germany 0049-89-3-10-61-38.   |                |
|   | C43                   | MOOG, ROBERT A. "The Human Finger-A Versatile Electronic Music Instrument Component", Audio Engineering Society Preprint, 1977, New York, NY, USA.  |                |
|  | C44                   | MS4-MS3 Solton, Ketrion lab, dist. By Bell Douvax Corp. 126 Rt. 303, 10994 W. Nyack, NY, USA.   |                |

Examiner  
SignatureDate  
Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

|   |                        |                          |                    |
|---|------------------------|--------------------------|--------------------|
| Substitute for form 1449A/PTO   |                        | <b>Complete if Known</b> |                    |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(use as many sheets as necessary) |                        | Application Number       |                    |
|   |                        | Filing Date              | September 30, 2003 |
|   |                        | First Named Inventor     | Lester F. Ludwig   |
|   |                        | Group Art Unit           |                    |
|   |                        | Examiner Name            |                    |
| Sheet 9 of 13   | Attorney Docket Number | 2738-21                  |                    |

| OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS |                       |   |                |
|---|-----------------------|---|----------------|
| Examiner Initials *                               | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
| [Signature]                                       | C45                   | MURPHY, AAMODT, Spicer and Royce (eds) Photoacoustic and Photothermal Phenomena II, 1990, vol. 62, Springer-Verlag, Berlin Heidelberg, Germany.   |                |
|   | C46                   | NAGY-UNGVARAI, Z. and HESS, BENNO "Control of Dynamic Pattern Formation in the Belous-ov-Zhabotinsky Reaction" Physica D (1991) North-Holland.  |                |
|   | C47                   | NICOLIS, G and BARAS, F (eds.), Chemical Instabilities, 1984, D.Reidel Publishing, Dordrecht/Bos-ton/Lancaster.   |                |
|   | C48                   | NICOLIS, G., "Nonlinear Phenomena in Chemistry", Introduction to Nonlinear Science, 1995, Cambridge University Press, Great Britain.  |                |
|   | C49                   | Omnichord OM-250m, Suzuki, Box 261030, San Diego, CA 92196, USA.  |                |
|   | C50                   | ORBAN, M., KURIN-CSORGEI, K., ZHABOTINSKY, A, and EPSTEIN, I, "New Indicators for Visualizing Pattern Formation in Uncatalyzed Bromate Oscillatory Systems", J. Am. Chem. Soc. 1998, Vol. 120, pp. 1146-1150.   |                |
|   | C51                   | PC-1600 Midi Controller, Peavy Corporation, 711 A St., Meridan, MS 39302-2898, USA.   |                |
|   | C52                   | PENNYWITT, KIRK "Robotic Tactile Sensing," Byte, Jan., 1986.  |                |
|   | C53                   | PLM 8128E, Peavey, Corporation, 711 A St., Meridan, MS 39302-2898, USA.   |                |
|   | C54                   | PMC10 Program. MIDI Foot Controller, Digitech, Salt Lake City, UT, USA.   |                |
|   | C55                   | Review of KORG X-230 Drum (later called "Wave Drum"), Electronic Musician, Apr. 1994.   |                |

|                    |             |                 |          |
|--------------------|-------------|-----------------|----------|
| Examiner Signature | [Signature] | Date Considered | 10/27/04 |
|--------------------|-------------|-----------------|----------|

\*EXAMINER: Initial reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

|   |    |    |    |                          |                    |
|---|----|----|----|--------------------------|--------------------|
| Substitute for form 1449A/PTO   |    |    |    | <b>Complete if Known</b> |                    |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(use as many sheets as necessary) |    |    |    | Application Number       |                    |
|   |    |    |    | Filing Date              | September 30, 2003 |
|   |    |    |    | First Named Inventor     | Lester F. Ludwig   |
|   |    |    |    | Group Art Unit           |                    |
|   |    |    |    | Examiner Name            |                    |
| Sheet   | 10 | of | 13 | Attorney Docket Number   | 2738-21            |

| OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS |                       |   |                |
|--|-----------------------|---|----------------|
| Examiner Initials *                                | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
|  | C56                   | RICH, ROBERT "Buchla Lightning MIDI Controller", Electronic Musician, Oct. 1991.  |                |
|  | C57                   | RICH, ROBERT "Buchla Thunder", Electronic Musician, Aug. 1990.  |                |
|  | C58                   | ROADS, C., "A Tutorial on Non-linear Distortion or Waveshaping Synthesis," Computer Music Journal, Vol. 3, No. 2, pp. 29-34, June 1979, People's Computer Company, Menlo Park, CA, USA.   |                |
|  | C59                   | Robotic Tactile Sensing, Kirk Pennywitt, BYTE, Jan. 1986.   |                |
|  | C60                   | Roland's COSM: A Whole New World of Sounds, Kikumoto/Meyer, Roland Users' Magazine. 7200 Dominion Circle, Los Angeles, CA, 90040-3696, USA.   |                |
|  | C61                   | RONSE, CHRISTIAN and DEVIJVER, PIERRE A., Connected Components in Binary Images: the Detection Problem, 1984, Research Studies Press/ John Wiley & Sons Inc., New York, NY, USA.  |                |
|  | C62                   | RSP-550 Algorithm Guide, Roland Corporation, 7200 Dominion Circle, Los Angeles, CA 90040-3696, USA.   |                |
|  | C63                   | RSP-550 Owners Manual, Roland Corporation, 7200 Dominion Circle, Los Angeles, CA 90040-3696, USA.   |                |
|  | C64                   | RUOFF, P. "How Bromate Oscillators Are Controlled", Am. Chem. Society, 1988.  |                |
|  | C65                   | Sentient Six digital guitar interface, PASSAC, Milpitas, CA 95035, USA.   |                |
|  | C66                   | SGE MACH II, Applied Research and Technology, 215 Tremont St., Rochester, NY 14608, USA.  |                |

|                    |  |                 |          |
|--------------------|--|-----------------|----------|
| Examiner Signature |  | Date Considered | 10/27/04 |
|--------------------|--|-----------------|----------|

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**



(use as many sheets as necessary)

Sheet 11 of 13

**Complete if Known**

|                        |                    |
|------------------------|--------------------|
| Application Number     |                    |
| Filing Date            | September 30, 2003 |
| First Named Inventor   | Lester F. Ludwig   |
| Group Art Unit         |                    |
| Examiner Name          |                    |
| Attorney Docket Number | 2738-21            |

**OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

| Examiner<br>Initials *  | Cite<br>No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
|---|--------------------------|---|----------------|
|    | C67                      | SHAPIRO, LARRY S, Affine Analysis of Image Sequences, 1995, Press Syndicate of the Cambridge University Press.  |                |
|   | C68                      | SLAWSON, WAYNE, Sound Color, 1985, University of California Press, Berkeley, CA, USA.   |                |
|   | C69                      | SNELL, JOHN M. "Sensors for Playing Computer Music with Expression", Proceedings of the Intl. Computer Music Conf. at Eastman, 1983.  |                |
|   | C70                      | Switchblade 16, Sound Sculpture, 5741 Arapahoe Rd. Ste. 2a Boulder, CO 80303, USA.  |                |
|   | C71                      | Synthophone, Softwind Instruments, 304 Newbury St. Ste. 323, Boston, MA 02155, USA.   |                |
|   | C72                      | Tactile sensors and the gripping challenge, IEEE Spectrum Aug. 1985.  |                |
|   | C73                      | The Fretless Wizard, Biaxe, P.O. Box 15426, Stamford, CT, 06901-0426, USA.  |                |
|   | C74                      | Trilogy, Hipshot Music Prods. Van Nuys, NY, USA.  |                |
|   | C75                      | TYSON, JOHN J., The Belousov-Zhabotinskii Reaction, Springer-Verlag, Berlin/Heidelberg, Germany.  |                |
|   | C76                      | Unlocking the Secrets of HRM (Harmonic Restructure Modeling), Craig Anderton, Roland Users' Magazine, 7200 Dominion Circle, Los Angeles, CA 90040-3696, USA.  |                |
|  | C77                      | Various 6D Tracking Products, Ascension Technology Corporation, PO Box 527, Burlingame, VT 05402, USA.  |                |

Examiner  
SignatureDate  
Considered



\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

|   |    |    |    |                          |                    |
|---|----|----|----|--------------------------|--------------------|
| Substitute for form 1449A/PTO   |    |    |    | <b>Complete if Known</b> |                    |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(use as many sheets as necessary) |    |    |    | Application Number       |                    |
|   |    |    |    | Filing Date              | September 30, 2003 |
|   |    |    |    | First Named Inventor     | Lester F. Ludwig   |
|   |    |    |    | Group Art Unit           |                    |
|   |    |    |    | Examiner Name            |                    |
| Sheet   | 12 | of | 13 | Attorney Docket Number   | 2738-21            |

| OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS                                   |                       |   |                |
|---|-----------------------|---|----------------|
| Examiner Initials *   | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
|    | C78                   | VERNER, J. Artif Starr Switch Company Ztar 624-D, Electronic Musician, Nov. 1994.   |                |
|   | C79                   | VG-8 Users Manual, Roland Corporation, 7200 Dominion Circle, Los Angeles, CA, 90040-3696, USA.  |                |
|   | C80                   | VIBERG, MATS, Subspace Fitting Concepts in Sensor Array Processing, Linkoping Studies in Science and Technology, 1989, Dissertations No. 27 Linkoping, Sweden.  |                |
|   | C81                   | VISINTIN, A. (ed.), Models of Hysteresis, Longman Scientific & Technical, 1993, Harlow, En-gland.   |                |
|   | C82                   | WANG, X-J, and NICOLIS, G. "Bifurcation Phenomena in Coupled Chemical Oscillators: Normal Form Analysis and Numerical Simulations", Physica 26D (1987), pp. 140-155, North-Holland, Amsterdam.  |                |
|   | C83                   | WESSEL, C., "A Tutorial on Non-linear Distribution or Waveshaping Synthesis", Computer Music Journal, Jun. 1979, Vol. 3, No. 2, pp. 29-34, People's Computer Company, Menlo Park, CA., USA.   |                |
|   | C84                   | WILKINSON, SCOTT "SynchroVoice MidiVox" Electronic Musician, Jul. 1992.   |                |
|   | C85                   | WINCKEL and FRITZ, Music Sound, and Sensation: A Modern Exposition, 1967, Dover, New York, USA.   |                |
|   | C86                   | Wind Machine, Anatek, Creation Technologies, 400 Brooksbank Ave. B.C. Canada V7J-1G9  |                |
|   | C87                   | WX11 and Wt11, Yamaha, 6600 Orangethorpe Ave., Box 6600, Buena Park, CA, USA.   |                |
|  | C88                   | XSDR AI2 Synthesizer Module, KORG, Suginamiku, Tokyo, Japan.  |                |

|                    |   |                 |          |
|--------------------|---|-----------------|----------|
| Examiner Signature |  | Date Considered | 10/27/04 |
|--------------------|---|-----------------|----------|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

|   |    |    |    |                          |                    |
|---|----|----|----|--------------------------|--------------------|
| Substitute for form 1448A/PTO   |    |    |    | <b>Complete if Known</b> |                    |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(use as many sheets as necessary) |    |    |    | Application Number       |                    |
|   |    |    |    | Filing Date              | September 30, 2003 |
|   |    |    |    | First Named Inventor     | Lester F. Ludwig   |
|   |    |    |    | Group Art Unit           |                    |
|   |    |    |    | Examiner Name            |                    |
| Sheet   | 13 | of | 13 | Attorney Docket Number   | 2738-21            |

| OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS |                       |   |                |
|--|-----------------------|---|----------------|
| Examiner Initials *                                | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
|  | C89                   | Yamaha FS1R, Electronic Musician, Dec., 1998.   |                |
|  | C90                   | Yamaha WX11 and WT11, Midi Magazine Mar./Apr. 1994. Yamaha Corp. of America, 6600 Orangethorpe Ave., PO Box 6600 Buena Park, CA 90622-6600, 714 522-9011.   |                |
|  | C91                   | ZTAR Midi Fingerboard Controllers-Starr Instruments/Starr Switch, 1717 Fifth Ave., San Diego, CA 92101, USA.  |                |
|  |                       |   |                |
|  |                       |   |                |
|  |                       |   |                |
|  |                       |   |                |
|  |                       |   |                |
|  |                       |   |                |
|  |                       |   |                |
|  |                       |   |                |
|  |                       |   |                |
|  |                       |   |                |

|                    |  |                 |          |
|--------------------|--|-----------------|----------|
| Examiner Signature |  | Date Considered | 10/27/02 |
|--------------------|--|-----------------|----------|

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.